Kentucky
CABINET FOR HEALTH SERVICES
DEPARTMENT FOR PUBLIC HEALTH
DIVISION OF EPIDEMIOLOGY
& HEALTH PLANNING
Epidemiologic Notes & Reports

Volume 34 Number 3 March 1999

Inside This Issue

Recommendations for Prevention and Control of Hepatitis C Virus (HCV) Infection .....1-5 & 7-10
Proclamation … by Paul E. Patton, Governor of the Commonwealth of Kentucky 6
Updates . . . 1998-1999 Influenza Surveillance 10
Additional Yellow Fever Vaccination Center 10
HIV/AIDS Clinical Trails 10

Recommendations for Prevention and Control of Hepatitis C Virus (HCV) Infection

This article is taken from *Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease* by the Centers for Disease Control and Prevention (CDC), MMWR 1998:47 (No. RR – 19): 1-39 and published October 16, 1998.

Additional resources on HCV include the CDC Hepatitis Hotline at 1-888-4HepCDC (1-888-443-7232) or access the Internet at www.cdc.gov/ncidod/diseases/hepatitis/hepatitis.htm Also, the American Liver Foundation at 1-800-223-0179 or www. liverfoundation.org; the Hepatitis C Foundation at www.hepcfoundation.org ; and, the Internet site of former Surgeon General, C. Everett Koop, www.epidemic.org.

Terms and Abbreviations Used in this Article
Acute hepatitis C: Newly acquired symptomatic hepatitis C virus(HCV) infection.
ALT: Alanine aminotransferase.
Anti-HCV: Antibody to HCV that develops in response to HCV infection; detectable in persons with acute, chronic, and resolved infection.
AST: Aspartate aminotransferase.
Chronic (persistent) HCV infection: Persistent infection with HCV; characterized by detection of HCV RNA 6 months or more after newly acquired infection.
Chronic hepatitis C: Liver inflammation in patients with chronic HCV infection; characterized by abnormal levels of liver enzymes.
EIA: Enzyme immunoassay.
HCV: Hepatitis C virus.
HCV-positive: Positive for anti-HCV as verified by supplemental testing or positive for HCV RNA.
HCV RNA: Hepatitis C virus ribonucleic acid.
Positive predictive value: Probability that a positive screening test is truly positive; dependent on prevalence of disease in a population.
Qualitative RT-PCR for HCV RNA: Test to detect HCV RNA by amplification of viral genetic sequences.
Quantitative assays for HCV RNA: Tests to detect HCV RNA concentration (viral load) by amplification of viral genetic sequences or by signal amplification.
Resolved HCV infection: Recovery following hepatitis C virus infection; characterized by sustained disappearance of serum HCV RNA and normalization of liver enzymes.
RIBA™: Recombinant immunoblot assay.
RT-PCR: Reverse transcriptase polymerase chain reaction.
Supplemental anti-HCV test: Additional test (i.e.,RIBA™) used to verify a positive anti-HCV result obtained by EIA.

INTRODUCTION
HCV infection is the most common chronic bloodborne infection in the United States. The Centers for Disease Control and Prevention (CDC) staff estimate that during the 1980s, an average of 230,000 new infections occurred each year (CDC, unpublished data). Although since 1989 the annual number of new infections has declined by greater than 80% to 36,000 by 1996 (1,2), data from the Third National Health and Nutrition Examination Survey (NHANES III), conducted during 1988-1994, have indicated that an estimated 3.9 million (1.8%) Americans have been infected with HCV (3). Most of these persons are chronically infected and might not be aware of their infection because they are not clinically ill. Infected persons serve as a

source of transmission to others and are at risk for chronic liver disease or other HCV-related chronic diseases during the first two or more decades following initial infection.

Chronic liver disease is the tenth leading cause of death among adults in the United States, and accounts for approximately 25,000 deaths annually, or approximately 1% of all deaths (4). Population-based studies indicate that 40% of chronic liver disease is HCV-related, resulting in an estimated 8,000-10,000 deaths each year (CDC, unpublished data). Current estimates of medical and work-loss costs of HCV-related acute and chronic liver disease are greater than $600 million annually (CDC, unpublished data), and HCV-associated end-stage liver disease is the most frequent indication for liver transplantation among adults. Because most HCV-infected persons are aged 30-49 years (3), the number of deaths attributable to HCV-related chronic liver disease could increase substantially during the next 10-20 years as this group of infected persons reaches ages at which complications from chronic liver disease typically occur.

HCV is transmitted primarily through large or repeated direct percutaneous exposures to blood. In the United States, the relative importance of the two most common exposures associated with transmission of HCV, blood transfusion and injecting-drug use, has changed over time (2,5). Blood transfusion, which accounted for a substantial proportion of HCV infections acquired more than 10 years ago, rarely accounts for recently acquired infections. In contrast, injecting-drug use consistently has accounted for a substantial proportion of HCV infections (60% of HCV current transmission in the U.S.). A high proportion of infections continues to be associated with injecting-drug use, but for reasons that are unclear, the dramatic decline in incidence of acute hepatitis C since 1989 correlates with a decrease in cases among injecting-drug users.

BACKGROUND

Prospective studies of transfusion recipients in the United States demonstrated that rates of posttransfusion hepatitis in the 1960s exceeded 20% (6). In the mid-1970s, available diagnostic tests indicated that 90% of posttransfusion hepatitis was not caused by hepatitis A or hepatitis B viruses and that the move to all-volunteer blood donors had reduced risks for posttransfusion hepatitis to 10% (7-9). Discovery of HCV by molecular cloning in 1988 indicated that non-A, non-B hepatitis was primarily caused by HCV infection (5,10-14).

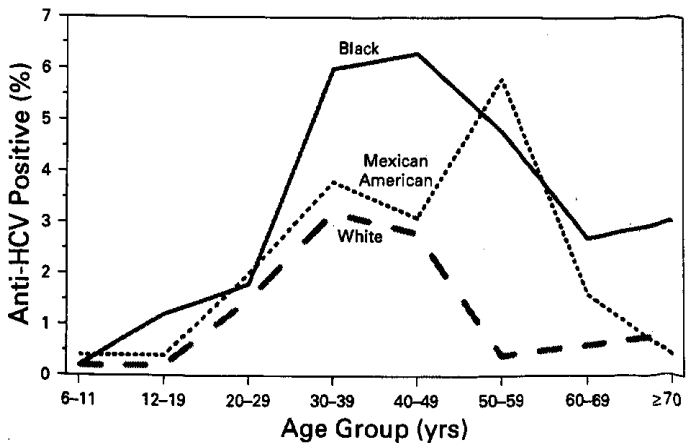
Epidemiology

Demographic Characteristics

HCV infection occurs among persons of all ages, but the highest incidence of acute hepatitis C is found among persons aged 20-39 years, and males predominate slightly (5). African Americans and whites have similar incidence of acute disease; persons of Hispanic ethnicity have higher rates.

In the general population, the highest prevalence rates of HCV infection are found among persons aged 30-49 years and among males (3). Unlike the racial/ethnic pattern of acute disease, African Americans have a substantially higher prevalence of HCV infection than do whites (Figure 1).

Figure 1. Prevalence of hepatitis C virus (HCV) infection by age and race/ethnicity – United States, 1988-



Source: Third National Health and Nutrition Examination Survey, CDC.

Prevalence of HCV Infection in Selected Populations in the United States

The greatest variation in prevalence of HCV infection occurs among persons with different risk factors for infection (15) Highest prevalence of infection is found among those with

large or repeated direct percutaneous exposures to blood (e.g., injecting-drug users, persons with hemophilia who were treated with clotting factor concentrates produced before 1987, and recipients of transfusions from HCV-positive donors) (12,13,16-22). Moderate prevalence is found among those with frequent but smaller direct percutaneous exposures (e.g., long-term hemodialysis patients) (23). Lower prevalence is found among those with inapparent percutaneous or mucosal exposures (e.g., persons with evidence of high-risk sexual practices) (24-28) or among those with small, sporadic percutaneous exposures (e.g., health-care workers) (29-33). Lowest prevalence of HCV infection is found among those with no high-risk characteristics (e.g., volunteer blood donors) (34; personal communication, RY Dodd, Ph.D., Head, Transmissible Diseases Department, Holland Laboratory, American Red Cross, Rockville, MD, July 1998). The estimated prevalence of persons with different risk factors and characteristics also varies widely in the U.S. population (3; 35-39; CDC, unpublished data).

Screening and Diagnostic Tests

Serologic Assays

The only tests currently approved by the U.S. Food and Drug Administration (FDA) for diagnosis of HCV infection are those that measure anti-HCV (107). These tests detect anti-HCV in greater than or equal to 97% of infected patients, but do not distinguish between acute, chronic, or resolved infection. As with any screening test, positive predictive value of enzyme immunoassay (EIA) for anti-HCV varies depending on prevalence of infection in the population and is low in populations with an HCV-infection

prevalence of less than 10% (1,34). Supplemental testing with a more specific assay (RIBA™) of a specimen with a positive EIA result prevents reporting of false-positive results, particularly in settings where asymptomatic persons are being tested.

Supplemental test results might be reported as positive, negative, or indeterminate. An anti-HCV-positive person is defined as one whose serologic results are EIA-test-positive and supplemental-test-positive. Persons with a negative EIA test result or a positive EIA and a negative supplemental test result are considered uninfected, unless other evidence exists to indicate HCV infection (e.g., ALT) levels in immunocompromised persons or persons with no other etiology for their liver disease). Indeterminate supplemental test results have been observed in recently infected persons who are in the process of seroconversion, as well as in persons chronically infected with HCV. Indeterminate anti-HCV results also might indicate a false-positive result, particularly in those persons at low risk for HCV infection.

Nucleic Acid Detection

The diagnosis of HCV infection also can be made by qualitatively detecting HCV RNA using gene amplification techniques (e.g., RT-PCR) (108). HCV RNA can be detected in serum or plasma within 1-2 weeks after exposure to the virus and weeks before the onset of ALT elevations or the appearance of anti-HCV. Rarely, detection of HCV RNA might be the only evidence of HCV infection.

Although RT-PCR assay kits for HCV RNA are available for research purposes from various manufacturers of diagnostic reagents, none have been approved by FDA. In addition, numerous laboratories perform RT-PCR using in-house laboratory methods and reagents.

Although not FDA-approved, RT-PCR assays for HCV infection are used commonly in clinical practice. Most RT-PCR assays have a lower limit of detection of 100-1,000 viral genome copies/mL. With adequate optimization of RT-PCR assays, 75%-85% of persons who are anti-HCV-positive and greater than 95% of persons with acute or chronic hepatitis C will test positive for HCV RNA. Some HCV-infected persons might be only intermittently HCV RNA-positive, particularly those with acute hepatitis C or with end-stage liver disease caused by hepatitis C. To minimize false-negative results, serum must be separated from cellular components within 2-4 hours after collection, and preferably stored frozen at -20 C or -70 C (109). If shipping is required, frozen samples should be protected from thawing. Because of assay variability, rigorous quality assurance and control should be in place in clinical laboratories performing this assay, and proficiency testing is recommended.

Quantitative assays for measuring the concentration (titer) of HCV RNA have been developed and are available from commercial laboratories (110). These assays also are not FDA-approved. In addition, they each use a different standard, which precludes direct comparisons between the assays. Quantitative assays should not be used as a primary test to confirm or exclude diagnosis of HCV infection or to monitor the endpoint of treatment. Testing for level of HCV RNA might help predict likelihood of response to antiviral therapy, although sequential measurement of HCV RNA levels has not proven useful in managing patients with hepatitis C.

At least six different genotypes and greater than 90 subtypes of HCV exist (112). Approximately 70% of HCV-infected persons in the United States are infected with genotype 1, with frequency of subtype 1a predominating over subtype 1b. Different nucleic acid detection methods are available commercially to group isolates of HCV, based on genotypes and subtypes (113). Evidence is limited regarding differences in clinical features, disease outcome, or progression to cirrhosis or hepatocellular carcinoma (HCC) among persons with different genotypes. However, differences do exist in responses to antiviral therapy according to HCV genotype. Rates of response in patients infected with genotype 1 are substantially lower than in patients with other genotypes, and treatment regimens might differ on the basis of genotype. Thus, genotyping might be warranted among persons with chronic hepatitis C who are being considered for antiviral therapy.

PREVENTION AND CONTROL

PRIMARY PREVENTION RECOMMENDATIONS

Blood, Plasma Derivatives, Organs, Tissues, and Semen

Current practices that exclude blood, plasma, organ, tissue, or semen donors determined to be at increased risk for HCV by history or who have serologic markers for HCV infection must be maintained to prevent HCV transmission from transfusions and transplants (1). Viral inactivation of clotting factor concentrates and other products derived from human plasma, including IG products, also must be continued, and all plasma-derived products that do not undergo viral inactivation should be HCV RNA negative by RT-PCR before release.

High-Risk Drug and Sexual Practices

Health-care professionals in all patient care settings routinely should obtain a history that inquires about use of illegal drugs (injecting and noninjecting) and evidence of high-risk sexual practices (e.g., multiple sex partners or a history of STDs). Primary prevention of illegal drug injecting will eliminate the greatest risk factor for HCV infection in the

United States (144). Although consistent data are lacking regarding the extent to which sexual activity contributes to HCV transmission, persons having multiple sex partners are at risk for STDs. Counseling and education to prevent initiation of drug-injecting or high-risk sexual practices is important, especially for adolescents. Persons who inject drugs or who are at risk for STDs should be counseled regarding what they can do to minimize their risk for becoming infected or of transmitting infectious agents to others, including need for vaccination against hepatitis B (144-148). Injecting and noninjecting illegal drug users and sexually active MSM also should be vaccinated against hepatitis A (149).

Prevention messages for persons with high-risk drug or sexual practices

- Persons who use or inject illegal drugs should be advised
  - to stop using and injecting drugs.
  - to enter and complete substance-abuse treatment, including relapse-prevention programs.
  - if continuing to inject drugs,
    - to never reuse or "share" syringes, needles, water, or drug preparation equipment; if injection equipment has been used by other persons, to first clean the equipment with bleach and water;
    - to use only sterile syringes obtained from a reliable source (e.g., pharmacies);
    - to use a new sterile syringe to prepare and inject drugs;
    - if possible, to use sterile water to prepare drugs; otherwise to use clean water from a reliable source (such as fresh tap water).
    - to use a new or disinfected container ("cooker") and a new filter ("cotton") to prepare drugs;
    - to clean the injection site before injection with a new alcohol swab; and
    - to safely dispose of syringes after one use.
  - to get vaccinated against hepatitis B and hepatitis A.
- Persons who are at risk for sexually transmitted diseases should be advised
  - that the surest way to prevent the spread of HIV infection and other sexually transmitted diseases is to have sex with only one uninfected partner or not to have sex at all.
  - to use latex condoms correctly and every time to protect themselves and their partners from diseases spread through sexual activity.
  - to get vaccinated against hepatitis B, and if appropriate, hepatitis A.

Counseling of persons with potential or existing illegal drug use or high-risk sexual practices should be conducted in the setting in which the patient is identified. If counseling services cannot be provided on-site, patients should be referred to a convenient community resource, or at a minimum, provided easy-to-understand health-education material. STD and drug-treatment clinics, correctional institutions, and HIV counseling and testing sites should routinely provide information concerning prevention of HCV and HBV infection in their counseling messages.

Percutaneous Exposures to Blood in Health Care and Other Settings

Health-Care Settings

Health-care, emergency medical, and public safety workers should be educated regarding risk for and prevention of bloodborne infections, including the need to be vaccinated against hepatitis B (154-156). Standard barrier precautions and engineering controls should be implemented to prevent exposure to blood. Protocols should be in place for reporting and follow-up of percutaneous or permucosal exposures to blood or body fluids that contain blood.

Health-care professionals responsible for overseeing patients receiving home infusion therapy should ensure that patients and their families (or caregivers) are informed of potential risk for infection with bloodborne pathogens, and should assess their ability to use adequate infection-control practices consistently (88). Patients and families should receive training with a standardized curriculum that includes appropriate infection-control procedures, and these procedures should be evaluated regularly through home visits.

Currently, no recommendations exist to restrict professional activities of health-care workers with HCV infection. As recommended for all health-care workers, those who are HCV-positive should follow strict aseptic technique and standard precautions, including appropriate use of hand washing, protective barriers, and care in the use and disposal of needles and other sharp instruments (154,155).

In chronic hemodialysis settings, intensive efforts must be made to educate new staff and reeducate existing staff regarding hemodialysis-specific infection-control practices that prevent transmission of HCV and other bloodborne pathogens (65,157). Hemodialysis-center precautions are more stringent than standard precautions. Standard precautions require use of gloves only when touching blood, body fluids, secretions, excretions, or contaminated items. In contrast, hemodialysis-center precautions require glove use whenever patients or hemodialysis equipment is touched. Standard precautions do not restrict use of supplies, instruments, and medications to a single patient; hemodialysis-center precautions specify that none of these

Recommendations for Prevention and Control of Hepatitis C Virus (HCV) Infection (continued from page 4)

items be shared among any patients. Thus, appropriate use of hemodialysis-center precautions should prevent transmission of HCV among chronic hemodialysis patients, and isolation of HCV-positive patients is not necessary or recommended.

Other Settings

Persons who are considering tattooing or body piercing should be informed of potential risks of acquiring infection with bloodborne and other pathogens through these procedures. These procedures might be a source of infection if equipment is not sterile or if the artist or piercer does not follow other proper infection-control procedures (e.g., washing hands, using latex gloves, and cleaning and disinfecting surfaces).

Routine precautions for the care of all hemodialysis patients

- Patients should have specific dialysis stations assigned to them, and chairs and beds should be cleaned after each use.
- Sharing among patients of ancillary supplies such as trays, blood pressure cuffs, clamps, scissors, and other nondisposable items should be avoided.
- Nondisposable items should be cleaned or disinfected appropriately between uses.
- Medications and supplies should not be shared among patients, and medication carts should not be used.
- Medications should be prepared and distributed from a centralized area.
- Clean and contaminated areas should be separated (e.g., handling and storage of medications and hand washing should not be done in the same or an adjacent area to that where used equipment or blood samples are handled).

SECONDARY PREVENTION RECOMMENDATIONS

Persons for Whom Routine HCV Testing Is Recommended

Testing should be offered routinely to persons most likely to be infected with HCV who might require medical management, and testing should be accompanied by appropriate counseling and medical follow-up. In addition, anyone who wishes to know or is concerned regarding their HCV-infection status should be provided the opportunity for counseling, testing, and appropriate follow-up. The determination of which persons at risk to recommend for routine testing is based on various considerations, including a known epidemiologic relationship between a risk factor and acquiring HCV infection, prevalence of risk behavior or characteristic in the population, prevalence of infection among those with a risk behavior or characteristic, and the need for persons with a recognized exposure to be evaluated for infection.

Persons who should be tested routinely for hepatitis C virus (HCV) infection based on their risk for infection

- Persons who ever injected illegal drugs, including those who injected once or a few times many years ago and do not consider themselves as drug users.
- Persons with selected medical conditions, including
    - persons who received clotting factor concentrates produced before 1987;
    - persons who were ever on chronic (long-term) hemodialysis; and
    - persons with persistently abnormal alanine aminotransferase levels.
- Prior recipients of transfusions or organ transplants, including
    - persons who were notified that they received blood from a donor who later tested positive for HCV infection;
    - persons who received a transfusion of blood or blood components before July 1992; and
    - persons who received an organ transplant before July 1992.

Persons who should be tested routinely for HCV-infection based on a recognized exposure

- Healthcare, emergency medical, and public safety workers after needle sticks, sharps, or mucosal exposures to HCV-positive blood.
- Children born to HCV-positive women.

Persons Who Have Ever Injected Illegal Drugs

Health-care professionals in primary-care and other appropriate settings routinely should question patients regarding their history of injecting-drug use, and should counsel, test, and evaluate for HCV infection, persons with such histories. Current injecting-drug users frequently are not seen in the primary health-care setting and might not be reached by traditional media; therefore, community-based organizations serving these populations should determine the most effective means of integrating appropriate HCV information and services into their programs.

Testing persons in settings with potentially high proportions of injecting-drug users (e.g., correctional institutions, HIV counseling and testing sites, or drug and STD treatment programs) might be particularly efficient for identifying HCV-positive persons. HCV testing programs in these settings should include counseling and referral or arrangements for medical management. However, limited experience exists in combining HCV programs with existing HIV, STD, or other established services for populations at high risk for infection with bloodborne pathogens. Studies are needed to determine the best

approaches for reaching persons who might not identify themselves as being at risk for HCV infection.

Persons with Selected Medical Conditions

Persons with hemophilia who received clotting factor concentrates produced before 1987 and long-term hemodialysis patients should be tested for HCV infection. Educational efforts directed to health-care professionals, patient organizations, and agencies who care for these patients should emphasize the need for these patients to know whether they are infected with HCV and encourage testing for those who have not been tested previously. Periodic testing of long-term hemodialysis patients for purposes of infection control is currently not recommended (61). However, issues surrounding prevention of HCV and other bloodborne pathogen transmission in long-term hemodialysis settings are currently undergoing discussion, and updating recommendations for this setting is under development.

Persons with persistently abnormal ALT levels are often identified in medical settings. As part of their medical work-up, health-care professionals should test routinely for HCV infection persons with ALT levels above the upper limit of normal on at least two occasions. Persons with other evidence of liver disease identified by abnormal AST levels, which is common among persons with alcohol-related liver disease, should be tested also.

Prior Recipients of Blood Transfusions or Organ Transplants

Persons who might have become infected with HCV through transfusion of blood and blood components should be notified. Two types of approaches should be used -- a) a targeted, or directed, approach to identify prior transfusion recipients from donors who tested anti-HCV positive after multiantigen screening tests were widely implemented (July 1992 and later); and b) a general approach to identify all persons who received transfusions before July 1992. A targeted notification approach focuses on a specific group known to be at risk, and will reach persons who might be unaware they were transfused. However, because blood and blood-component donor testing for anti-HCV before July 1992 did not include confirmatory testing, most of these notifications would be based on donors who were not infected with HCV because their test results were falsely positive. A general education campaign to identify persons transfused before July 1992 has the advantage of not being dependent on donor testing status or availability of records, and potentially reaches persons who received HCV-infected blood from donors who tested falsely negative on the less sensitive serologic test, as well as from donors before testing was available.

Health-Care, Emergency Medical, and Public Safety Workers After Needle Sticks, Sharps, or Mucosal Exposures to HCV-Positive Blood

Individual institutions should establish policies and procedures for HCV testing of persons after percutaneous or permucosal exposures to blood and ensure that all personnel are familiar with these policies and procedures (141). Health-care professionals who provide care to persons exposed to HCV in the occupational setting should be knowledgeable regarding the risk for HCV infection and appropriate counseling, testing, and medical follow-up.

Immune Globulin (IG) and antiviral agents are not recommended for postexposure prophylaxis of hepatitis C. Limited data indicate that antiviral therapy might be beneficial when started early in the course of HCV infection, but no guidelines exist for administration of therapy during the acute phase of infection. When HCV infection is identified early, the individual should be referred for medical management to a specialist knowledgeable in this area.

Postexposure follow-up of health-care, emergency medical, and public safety workers for HCV infection

- For the source, baseline testing for anti-HCV.
- For the person exposed to an HCV-positive source, baseline and follow-up testing including
  - -- baseline testing for anti-HCV and ALT activity; and
  - -- follow-up testing for anti-HCV (e.g., at 4-6 months) and ALT activity. (If earlier diagnosis of HCV infection is desired, testing for HCV RNA may be performed at 4-6 weeks.)
- Confirmation by supplemental anti-HCV testing of all anti-HCV results reported as positive by enzyme immunoassay.

Children Born to HCV-Positive Women

Because of their recognized exposure, children born to HCV-positive women should be tested for HCV infection (158). IG and antiviral agents are not recommended for postexposure prophylaxis of infants born to HCV-positive women. Testing of infants for anti-HCV should be performed no sooner than age 12 months, when passively transferred maternal anti-HCV declines below detectable levels. If earlier diagnosis of HCV infection is desired, RT-PCR for HCV RNA may be performed at or after the infant's first well-child visit at age 1-2 months. Umbilical cord blood should not be used for diagnosis of perinatal HCV infection because cord blood can be contaminated by maternal blood. If positive for either anti-HCV or HCV RNA, children should be evaluated for the presence or development of liver disease, and those children with persistently elevated ALT levels should be referred to a specialist for medical management.

Recommendations for Prevention and Control of Hepatitis C Virus (HCV) Infection (continued from page 7)

Persons for Whom Routine HCV Testing Is Not Recommended

Unless the following persons have risk factors for infection, routine testing for HCV infection is not recommended.

- Health-care, emergency medical, and public safety workers.
- Pregnant women.
- Household (nonsexual) contacts of HCV-positive persons.
- The general population.

Persons for Whom Routine HCV Testing Is of Uncertain Need

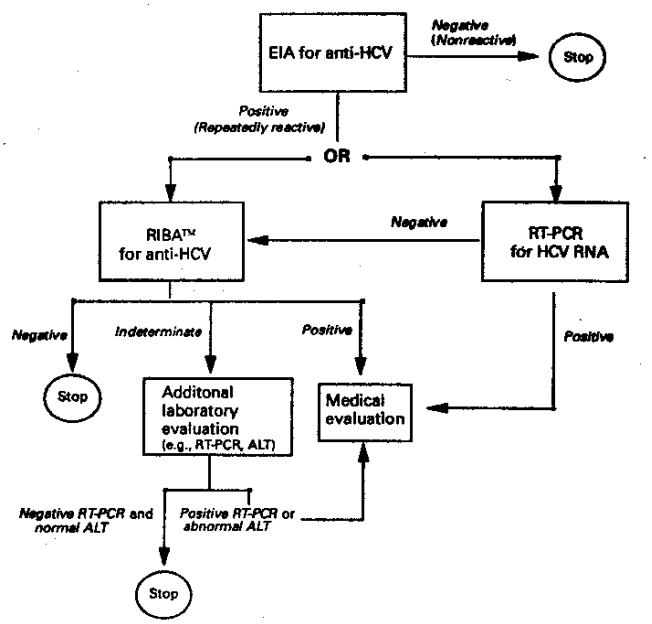
- Recipients of transplanted tissue (e.g., corneal, musculoskeletal, skin, ova, or sperm)
- Intranasal cocaine and other noninjecting illegal drug users
- Persons with a history of tattooing or body piercing
  In settings having a high proportion of HCV-infected persons and where tattooing and body piercing might be performed in an unregulated manner (e.g., correctional institutions), these types of exposures might be a risk factor for HCV infection.
- Persons with a history of multiple sex partners or STDs
  Health-care professionals who provide services to persons with STDs should use that opportunity to take complete risk histories from their patients to ascertain the need for HCV testing, provide risk-reduction counseling, offer hepatitis B vaccination, and, if appropriate, hepatitis A vaccination.
- Long-term steady sex partners of HCV-positive persons

Testing for HCV Infection

Consent for testing should be obtained in a manner consistent with that for other medical care and services provided in the same setting, and should include measures to prevent unwanted disclosure of test results to others. Persons should be provided with information regarding

- exposures associated with the transmission of HCV, including behaviors or exposures that might have occurred infrequently or many years ago;
- the test procedures and the meaning of test results;
- the nature of hepatitis C and chronic liver disease;
- the benefits of detecting infection early;
- available medical treatment; and
- potential adverse consequences of testing positive, including disrupted personal relationships and possible discriminatory action (e.g., loss of employment, insurance, and educational opportunities).

Figure 2. Hepatitis C virus infection: Testing algorithum for asymptomatic persons.



Comprehensive information regarding hepatitis C should be provided before testing; however, this might not be practical when HCV testing is performed as part of a clinical work-up or when testing for anti-HCV is required. In these cases, persons should be informed that a) testing for HCV infection will be performed, b) individual results will be kept confidential, and c) appropriate counseling and referral will be offered if results are positive.

Testing for HCV infection can be performed in various settings which should be prepared to provide appropriate information regarding hepatitis C and provide or offer referral for additional medical care or other needed services (e.g., drug treatment). Facilities providing HCV testing should have access to information regarding referral resources, including availability, accessibility, and eligibility criteria of local medical care and mental health professionals, support groups, and drug-treatment centers. The diagnosis of HCV infection can be made by detecting either anti-HCV or HCV RNA. Anti-HCV is recommended for routine testing of asymptomatic persons, and should include use of both EIA to test for anti-HCV and supplemental or confirmatory testing with an additional, more specific assay (Figure 2). Use of supplemental antibody testing

(i.e., RIBA™) for all positive anti-HCV results by EIA is preferred, particularly in settings where clinical services are not provided directly.

Supplemental anti-HCV testing confirms the presence of anti-HCV (i.e., eliminates false-positive antibody results), which indicates past or current infection, and can be performed on the same serum sample collected for the EIA (i.e., routine serology). Confirmation or exclusion of HCV infection in a person with indeterminate anti-HCV supplemental test results should be made on the basis of further laboratory testing, which might include repeating the anti-HCV in two or more months or testing for HCV RNA and ALT level.

In clinical settings, use of RT-PCR to detect HCV RNA might be appropriate to confirm the diagnosis of HCV infection (e.g., in patients with abnormal ALT levels or with indeterminate supplemental anti-HCV test results) although RT-PCR assays are not currently FDA-approved. Detection of HCV RNA by RT-PCR in a person with an anti-HCV-positive result indicates current infection. However, absence of HCV RNA in a person with an anti-HCV-positive result based on EIA testing alone (i.e., without supplemental anti-HCV testing) cannot differentiate between resolved infection and a false-positive anti-HCV test result. In addition, because some persons with HCV infection might experience intermittent viremia, the meaning of a single negative HCV RNA result is difficult to interpret, particularly in the absence of additional clinical information. If HCV RNA is used to confirm anti-HCV results, a separate serum sample will need to be collected and handled in a manner suitable for RT-PCR. If the HCV RNA result is negative, supplemental anti-HCV testing should be performed so that the anti-HCV EIA result can be interpreted before the result is reported to the patient.

Laboratories that perform HCV testing should follow the recommended anti-HCV testing algorithm (Figure 2), which includes use of supplemental testing. Having assurances that the HCV testing is performed in accredited laboratories whose services adhere to recognized standards of good laboratory practice is also necessary. Laboratories that perform HCV RNA testing should review routinely their data regarding internal and external proficiency testing because of great variability in accuracy of HCV RNA testing.

Prevention Messages and Medical Evaluation

HCV-specific information and prevention messages should be provided by trained personnel in public and private health-care settings to infected persons and individuals at risk. Health-education materials should include a) general information about HCV infection; b) risk factors for infection, transmission, disease progression, and treatment; and c) detailed prevention messages appropriate for the population being tested. Written materials might also include information about community resources available for HCV-positive patients for medical evaluation and social support, as appropriate.

Negative Test Results

If their exposure was in the past, persons who test negative for HCV should be reassured.

Indeterminate Test Results

Persons whose HCV test results are indeterminate should be advised that the result is inconclusive, and they should receive appropriate follow-up testing or referral for further testing (see section regarding testing for HCV infection).

Positive Test Results

Persons who test positive should be provided with information regarding the need for a) preventing further harm to their liver; b) reducing risks for transmitting HCV to others; and c) medical evaluation for chronic liver disease and possible treatment.

- To protect their liver from further harm, HCV-positive persons should be advised to
  - not drink alcohol;
  - not start any new medicines, including over-the-counter and herbal medicines, without checking with their doctor; and
  - get vaccinated against hepatitis A if liver disease is found to be present.
- To reduce the risk for transmission to others, HCV-positive persons should be advised to
  - not donate blood, body organs, other tissue, or semen;
  - not share toothbrushes, dental appliances, razors, or other personal-care articles that might have blood on them; and
  - cover cuts and sores on the skin to keep from spreading infectious blood or secretions.
- HCV-positive persons with one long-term steady sex partner do not need to change their sexual practices. They should
  - discuss the risk, which is low but not absent, with their partner (If they want to lower the limited chance of spreading HCV to their partner, they might decide to use barrier precautions {e.g., latex condoms}); and
  - discuss with their partner the need for counseling and testing.
- HCV-positive women do not need to avoid pregnancy or breastfeeding. Potential, expectant, and new parents should be advised that

Recommendations for Prevention and Control of Hepatitis C Virus (HCV) Infection (continued from page 9)

- approximately 5 out of every 100 infants born to HCV-infected women become infected (This occurs at the time of birth, and no treatment exists that can prevent this from happening);
- infants infected with HCV at the time of birth seem to do very well in the first years of life (More studies are needed to determine if these infants will be affected by the infection as they grow older);
- no evidence exists that mode of delivery is related to transmission; therefore, determining the need for cesarean delivery versus vaginal delivery should not be made on the basis of HCV infection status;
- limited data regarding breastfeeding indicate that it does not transmit HCV, although HCV-positive mothers should consider abstaining from breastfeeding if their nipples are cracked or bleeding;
- infants born to HCV-positive women should be tested for HCV infection and if positive, evaluated for the presence or development of chronic liver disease (see section regarding routine testing of children born to HCV-positive women); and
- if an HCV-positive woman has given birth to any children after the woman became infected with HCV, she should consider having the children tested.

- Other counseling messages
  - HCV is not spread by sneezing, hugging, coughing, food or water, sharing eating utensils or drinking glasses, or casual contact.
  - Persons should not be excluded from work, school, play, child-care or other settings on the basis of their HCV infection status.

Update . . . 1998-1999 Influenza Surveillance

The Division of Laboratory Services, Department for Public Health, had received 125 viral specimens for influenza through March 22, 1999. Sixty of the 125 were positive for influenza – 39 were type A; 21 were type B. Results are pending on two specimens. The remaining specimens either were negative or identified other viruses.

Influenza type A has been identified in specimens submitted from the following counties: Barren, Boone, Bourbon, Hart, Jefferson, McCracken, Madison, Metcalf, Oldham, Warren, Washington.

Influenza type B has been identified in specimens submitted from the following counties: Ballard, Barren, Boyd, Jessamine, Jefferson, McCracken, Madison, Metcalfe, Oldham, Warren.

Questions related to influenza may be directed to Michael Auslander, DVM, MSPH, at 502-564-3418.

Update . . . Additional Yellow Fever Center

Please add the following Yellow Fever Vaccination Center to the list published in the January/February 1999 issue of *Kentucky Epidemiologic Notes and Reports*, page 2: Mark A. Boyd, MD, Associate Director, St. Elizabeth Family Practice Center, 413 South Loop Road, Edgewood, KY 41017, telephone 606-344-3800.

NOTE HIV/AIDS Clinical Trails

Readers seeking information on HIV/AIDS clinical trails may contact Richard Greenburg, MD, Professor of Medicine, University of Kentucky. The toll free number is 800-365-2470. Dr. Greenburg is interested in sharing the latest treatment information or therapies with other practitioners. His address is: Division of Infectious Diseases, MN668A, 800 Rose Street, Lexington, KY 40536-0084.

KENTUCKY EPIDEMIOLOGIC NOTES & REPORTS
Printed With State Funds
by the
COMMONWEALTH OF KENTUCKY
CABINET FOR HEALTH SERVICES
DEPARTMENT FOR PUBLIC HEALTH
275 EAST MAIN STREET
FRANKFORT, KENTUCKY 40621

BULK RATE
U.S. Postage Paid
Lexington, KY
Permit No. 1

Kentucky Epidemiologic Notes and Reports is a free, monthly publication of the Kentucky Department for Public Health. Materials may be reproduced without permission. For more information call 502-564-3418.

RETURN SERVICE REQUESTED

PROCLAMATION ... *by Paul E. Patton, Governor of the Commonwealth of Kentucky*

To All To Whom These Presents Shall Come:

WHEREAS, The good health of all Kentuckians is essential to the success of the Commonwealth, and

WHEREAS, Hepatitis C is a liver disease caused by the hepatitis C virus which is found in the blood of people who have this infection, and

WHEREAS, Most persons who get hepatitis C carry the virus for the rest of their lives, and

WHEREAS, Many who have the virus in their blood do not know it and are not aware that they may be spreading the infection to others, and

WHEREAS, All Kentuckians need to know about hepatitis C, the risk factors for becoming infected, taking care of themselves if they are infected, and halting the spread of the infection to others;

NOW, THEREFORE, I, PAUL E. PATTON, Governor of the Commonwealth of Kentucky, do hereby proclaim March, 1999 as **HEPATITIS C AWARENESS MONTH** in Kentucky.

Done at the Capitol, in the city of Frankfort, this the 15TH day of January, in the year of Our Lord One Thousand Nine Hundred Ninety-nine and in the 207TH year of the Commonwealth.

Paul E. Patton, Governor

John Y. Brown, III, Secretary of State